

Sealing medium for composite packaging materials

## DESCRIPTION

The invention relates to a sealing medium for composite packaging materials, in particular for packaging transdermal therapeutic systems (TTS) with active ingredients which are volatile in some cases.

Sealing media for producing composite packaging materials of the type mentioned are known. They must be selected in respect of their properties so that they display, for example, no significant uptake of active ingredient from the TTS. Possible interactions with active substances or ancillary substances from the TTS must be strictly avoided or reduced as far as possible. In addition, the layer thicknesses of such media should be as small as possible because with large layer thicknesses there is observed to be in many cases an increased, unwanted interaction between product and packaging as a result of migration and penetration.

Comparatively thick layers of a sealing medium are also disadvantageous because the activation thereof in the brief melting process for bonding requires a comparatively large input of and time of exposure to heat for activating the sealing layer. To comply with these requirements, high-quality composite packaging materials have been used to date, and the sealing media employed therein have had to be applied in relatively large layer thicknesses between 20 and 60 microns with at least 20 g/m<sup>2</sup> because of the existing production processes. The said disadvantages arise from such large layer thicknesses.

The invention is based on the object of providing a sealing medium, with the use of which the abovementioned disadvantages and difficulties in the production of packs for active ingredient-containing plaster systems are avoided, which develops sufficiently high adhesive strengths when applied in an extremely thin layer, has the consistency of a printing ink which can be processed with conventional printing machines, allows insignificant uptake of active ingredient because of its chemical composition, in particular displays a barrier function towards volatile active ingredients such as nicotine, and can be used without difficulty in simple processes, for example without elaborate drying of a laminating adhesive or melting of a comparatively thick sealing film.

The object is achieved for a sealing medium of the type stated in the precharacterizing clause of Claim 1 of the invention by providing a heat sealing lacquer which is in the form of a liquid phase for applying extremely thin sealing layers in a printing process for example to partial areas of composite packaging materials.

The achievement of the invention is that, as a consequence of its small layer thickness, the sealing lacquer permits insignificant uptake of active ingredient. Moreover the possibility of applying the sealing lacquer of the invention in a printing process partially to areas of packaging materials means a further reduction in the amount used and thus in the costs of materials as well as possible interactions with active ingredient in the packaged plaster. The small amount of sealing medium used has advantages both in ecological and in economic respects not only for the production of plaster packaging but also for the disposal thereof. In addition, application in a printing process facilitates accurate partial use of the

sealing lacquer only in the sealing area and thus reduces interactions between product and packaging material. On the other hand, partial use of the sealing lacquer only in the sealing area means that it is possible to have packaging systems in which desired interactions, for example in the case of moisture absorbers, between product and packaging can take the desired form. By contrast, with the full-area sealing layers previously employed the films or sheets always formed a first layer completely surrounding the product of a packaging.

Further embodiments of the invention are provided as specified in the dependent claims. The result in these tests is an optimization in ecological and economic terms as a result of the small amount of sealing lacquer to be applied with the aid of conventional simple printing machines, and of the minimization of the raw materials, which are mostly very costly, used for these purposes, both for the production of the packaging materials and for the disposal thereof.

The invention makes it possible for sealing layers which can be applied thereby to packaging material areas to have weights per unit area between 1 and 15 g/m<sup>2</sup>, preferably weights per unit area between 2.5 and 3.5 g/m<sup>2</sup>.

In addition, one embodiment of the invention provides for the sealing medium to be or contain an ethylene/methacrylic acid copolymer dispersion and for it to result, by reason of its chemical composition, in no measurable uptake of active ingredient. By reason of its chemical composition, it has an advantageous barrier effect towards volatile active ingredients, in particular nicotine. It can furthermore be activated very advantageously, when present in the form of an extremely thin sealing layer, to form an

adhesive melt phase with, by comparison, extremely small input of and time of exposure to heat. On the one hand, energy is saved, and, on the other hand, the production speed of available systems for producing different packaging materials and packs can be considerably increased, and thus the productivity can be significantly improved.

Finally, the invention achieves adhesion forces for the sealing medium, after activation and formation of an adhesive layer, which are in the region of the strength of the packaging materials which can be bonded therewith.

Figures 1 and 2 show packages produced with a sealing medium of the invention for active ingredient-containing TTS.

Figure 1 shows a package with an upper and lower backing layer 1 and with an upper and lower barrier layer, for example an aluminium foil, and sealing lacquer layers 3 partially applied to the barrier layers 2.

Figure 2 shows a somewhat different embodiment of the package with an upper and lower backing layer 1, barrier layers 2, for example an aluminium foil, underneath which is a flat packaging element 4 which interacts with the product, for example a moisture absorber, and finally partially applied sealing lacquer layers 3.

The invention makes it possible, in both a particularly economical and a particularly ecological manner, both to produce and to dispose of specific packagings for TTS, in particular those with volatile active ingredients, and meets the object stated at the outset in an optimal manner.